

Woody Island Coulee Grassland Bird Surveys

Blaine County, Montana 2008

Prepared for:

Bureau of Land Management, Malta Field Office

Prepared by:

Susan Lenard and Coburn L. Currier

Montana Natural Heritage Program
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Agreement Number:

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EXECUTIVE SUMMARY

Over the past several decades, populations of grassland associated birds have exhibited the steepest declines of any suite of bird species in North America. Loss of habitat throughout the continent, resulting from conversion of native prairie to agricultural production, has been identified as the primary cause of historic grassland bird declines. Large blocks of intact prairie lands remaining in Montana, therefore, provide critically important breeding habitat for many grassland bird species. Bureau of Land Management (BLM) lands, especially in the northeastern and north-central portions of the state, are important breeding habitats for many imperiled grassland species endemic to the Great Plains as the primary land cover in this area is native mixed-grass prairie. Few areas in the state contain such extensive blocks of intact grasslands.

Twenty-seven species of birds were recorded during the June 2008 project work at Woody Island Coulee. Ninety-three point counts were conducted along 31 transects resulting in 517

recorded bird observations. Thirteen species were documented within point count circles, while 14 species were recorded as occurring beyond the 100-meter radius during the point count surveys. Combining 2008 data with other documented observations in the Heritage Program database, a total of 41 bird species have been observed at Woody Island Coulee; 22 of them have displayed some evidence of breeding.

Eight bird species recorded at Woody Island Coulee in 2008 are Montana Species of Concern, seven of which are endemic to the Northern Great Plains: Ferruginous Hawk (*Buteo regalis*), Long-billed Curlew (*Numenius americanus*), Sprague's Pipit (*Anthus spragueii*), Lark Bunting (*Calamospiza melanocorys*), Baird's Sparrow (*Ammodramus bairdii*), McCown's Longspur (*Calcarius mccownii*), and Chestnut-collared Longspur (*Calcarius ornatus*). One more widespread Species of Concern, Swainson's Hawk (*Buteo swainsoni*), was also recorded during the project work.

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INTRODUCTION

In recent decades, grassland bird populations have exhibited range-wide declines (Knopf 1994, Peterjohn and Sauer 1999, Vickery et al. 1999, Askins et al. 2007). Historical conversion of the landscape to agricultural cropland is clearly the greatest contributing factor to loss of suitable habitat (Samson and Knopf 1994, Fitzgerald et al. 1999, Knapp et al. 1999, Blann 2006). Habitat loss resulting from fragmentation and conversion for agricultural, industrial, and human habitation uses continues, contributing further to grassland bird population declines. Additionally, a variety of land management practices in areas of remaining intact prairie can negatively impact prairie bird populations (Saab et al. 1995). Worldwide, grasslands are recognized as the most imperiled of terrestrial landscapes (Samson and Knopf 1996).

Individual grassland bird species choose where to settle for breeding and nesting from a matrix of habitats available across the prairie landscape. Historically, each species probably exhibited pronounced fluctuations in local abundance as vegetation conditions changed in response to drought, fire, and grazing by bison and locust. The extermination of bison, the extinction of Rocky Mountain locust, and aggressive control

of fire during the settlement of the Great Plains profoundly altered the composition of grasslands (Knapp et al. 1999). Grassland associated species favoring vegetation structure and composition promoted by human activities (managed grazing, fire suppression, and annual mowing) have generally benefited, while species requiring a more natural disturbance regime (periodic fire and historic grazing patterns) have generally experienced declines (Sauer et al. 2005). Because of the widespread loss of native grasslands, remaining tracts of prairie grassland vegetation are increasingly valuable for native bird species.

The limited extent of intact native prairie lands in Montana north of the Missouri River suggests the existing grassland parcels provide critical habitat to a variety of endemic prairie species, especially prairie birds. Increasing pressures from energy development, sodbusting, and other activities make these lands ever more important for the conservation of species with unique habitat requirements and limited breeding distribution. Point count surveys were conducted in north Blaine County by the Montana Natural Heritage Program during 2008 to inventory bird species within the BLM - Woody Island Coulee property.

STUDY AREA

Located on the Northern Glaciated Plains, the study area lies in the northern portion of Blaine County in north-central Montana. Blaine County lies adjacent to the border with Saskatchewan, Canada and is bounded by the Missouri River to the south, Hill and Chouteau Counties to the west, and Phillips County to the east. Major landscape features include two isolated mountain ranges (the Little Rockies and the Bears Paw), an area of glacial outwash known as the “Big Flat,” the glaciated plains, and the Milk River, which bisects the northcentral section of the county (SCS 1986). The main tributaries of the Milk River, which contribute runoff from approximately the northern two-thirds of the county, include Lodge, Battle, Thirtymile, Woody Island, Savoy, Wayne, Cottonwood, and

Fifteenmile Creeks. The project area lies in the glaciated plains north of the town of Turner, on the BLM lands identified as Woody Island Coulee, after Woody Island Creek, which drains southward to the Milk River.

Blaine County’s principal plant community is mid-and shortgrass prairie. The dominant species present in the northern portion of the county include western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula*), needle-and-thread (*Stipa comata*), prairie junegrass (*Koeleria macrantha*), blue grama (*Bouteloua gracilis*), winterfat (*Krascheninnikovia lanata*), and silver sagebrush (*Artemesia cana*). The local economic base is supported by both ranching and farming.

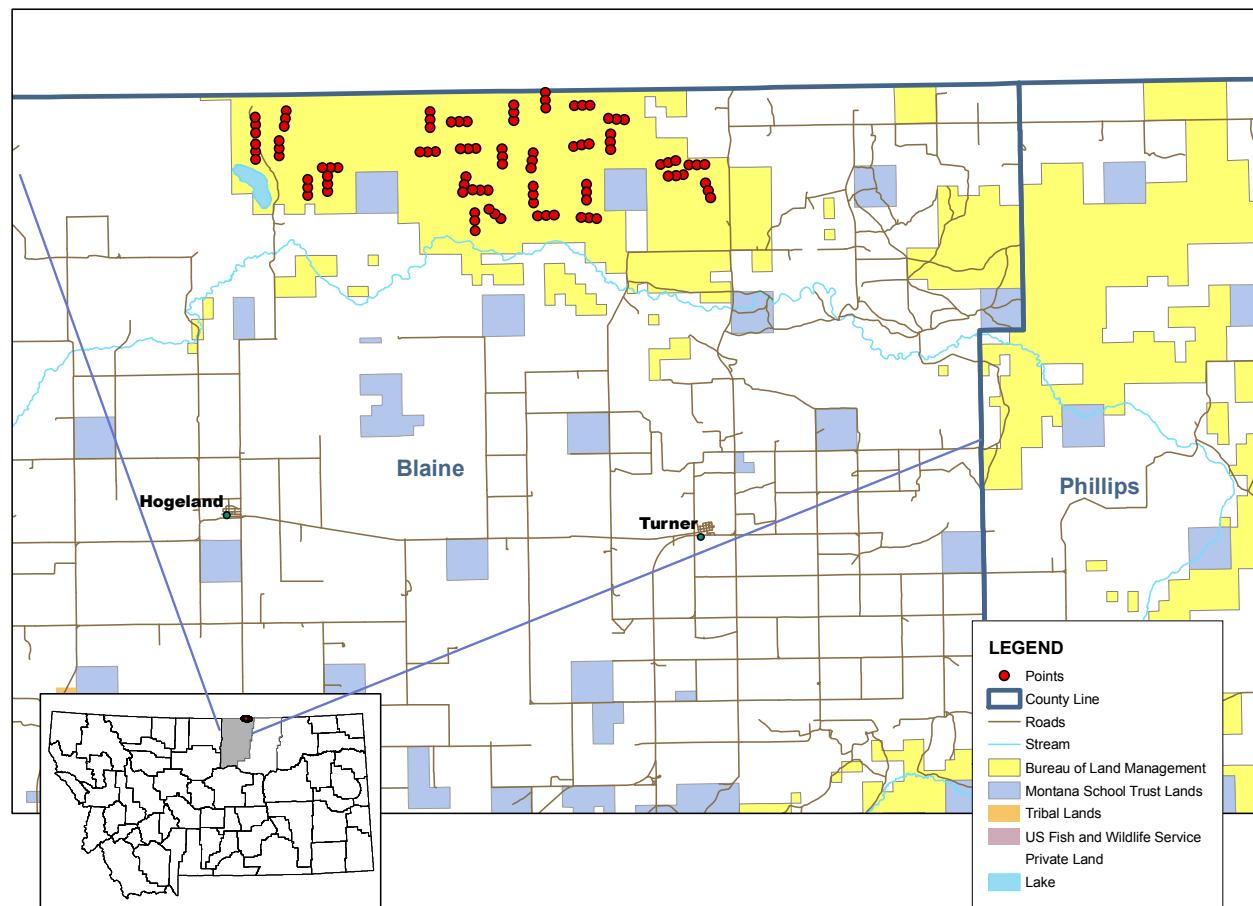


Figure 1. Woody Island Coulee Project Location.

METHODS

Point Selection

Each section (one-by-one mile square) and partial section contained within Woody Island Coulee were identified as the base unit for the inventory (39 sections were identified). Each section was randomly assigned two points as potential starts for a three point-transect along which surveys for prairie bird species would be conducted. Selection of a starting point within any given section depended upon accessibility and proximity

to other points (points selected were at least 300 meters from points in an adjacent section; given the time constraints of walking from point to point, some points were selected in order to maximize the number of point counts performed in a morning). The second and third points for each transect were identified by walking 300 meters from the previous point and recorded via a Magellan GPS unit at each location.

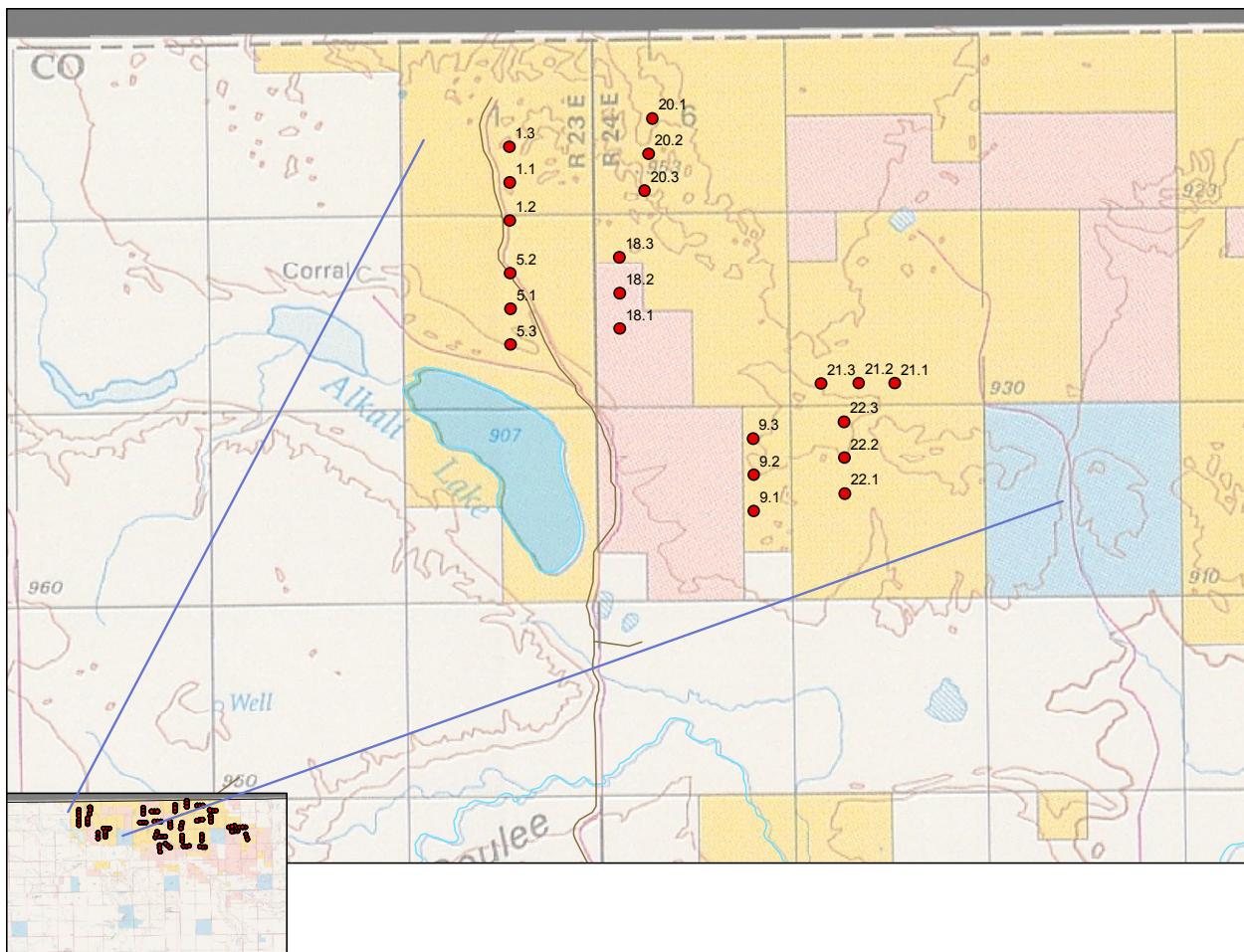


Figure 2. *Woody Island Coulee Points – West.*

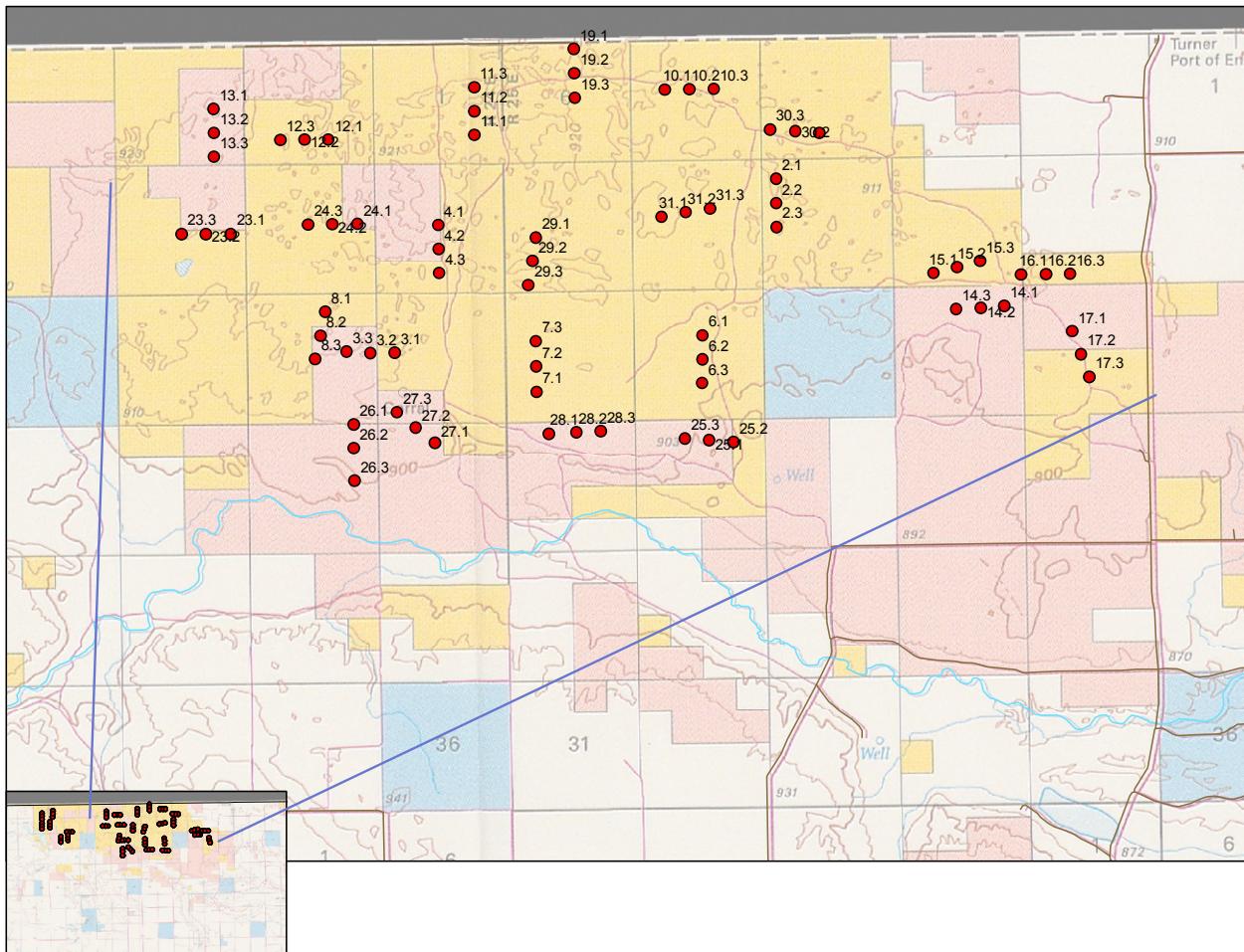


Figure 3. Woody Island Coulee Points - East.

Point Count Protocol

Point counts were conducted between 2 June and 30 June, 2008 by Susan Lenard and Coburn Currier, Heritage Program Zoologists. All point counts were ten minutes in duration and were conducted between 5:30 am and 10:00 am. During each point count, birds observed during time intervals of 0 - 3 minutes, 3 - 5 minutes, and 5 - 10 minutes were recorded separately. All birds detected visually and/or aurally within a visually-estimated 100-meter radius circle surrounding the center point were included in the tally. Each individual species was documented with the appropriate 4-letter AOU code, abundance noted, and identified as within the 100-meter circle, on the

edge, or outside of the circle. Birds that flew over the circle but did not land during the count were recorded as flyovers. Counts were not conducted during continuous rain or winds generally exceeding about 15 mph (though, one morning's counts were conducted as a dense fog rolled into the area).

Vegetation Measurement Protocol

Vegetation measurements were recorded at all points and consisted of 5 categories of cover type (grass, bare, shrub, water, and wet meadow) for which percentages were assigned.

RESULTS AND DISCUSSION

2008 Point Count Surveys

Twenty-seven species of birds, eight of which are state Species of Concern, were recorded during the June 2008 project work (Table 1). Ninety-three point counts were conducted along 31 transects resulting in 517 recorded bird observations.

Thirteen species were documented within point count circles, while 14 species were recorded as occurring beyond the 100-meter radius during the point counts.

The data derived from these points were added to the Bird Point Observation Database housed

at the Montana Natural Heritage Program. All data contained in the database that fell within the Woody Island Coulee boundaries were summarized collectively and are listed in the tables below (Tables 2-4).

Of the 41 bird species documented at Woody Island Coulee in the Point Observation Database, 22 of them have displayed some evidence of breeding; 14 are listed as state Species of Concern (Table 2).

Table 1. Species List for Woody Island Coulee during project 2008.

Common Name	Detected in Point Count Circle	Species of Concern
American Goldfinch		
Baird's Sparrow	x	SOC
Brewer's Blackbird		
Brown-headed Cowbird		
Canada Goose		
Chestnut-collared Longspur	x	SOC
Clay-colored Sparrow	x	
Common Nighthawk		
Ferruginous Hawk		SOC
Golden Eagle		
Horned Lark	x	
Killdeer	x	
Lark Bunting		SOC
Long-billed Curlew	x	SOC
Mallard		
Marbled Godwit	x	
McCown's Longspur	x	SOC
Mourning Dove		
Northern Harrier		
Savannah Sparrow	x	
Sharp-tailed Grouse		
Sprague's Pipit	x	SOC
Swainson's Hawk		SOC
Vesper Sparrow	x	
Western Meadowlark	x	
Willet	x	
Wilson's Snipe		

Table 2. Bird Species documented at Woody Island Coulee – in decreasing order of number of recorded observations.

Common Name	Record Count	S Rank	Breeding	SOC
Chestnut-collared Longspur	103	S3B	Yes	SOC
Horned Lark	94	S5	Yes	
Western Meadowlark	83	S5B	Yes	
McCown's Longspur	64	S2B	Yes	SOC
Savannah Sparrow	54	S5B	Yes	
Baird's Sparrow	43	S2B	Yes	SOC
Vesper Sparrow	32	S5B	Yes	
Sprague's Pipit	29	S2B	Yes	SOC
Willet	19	S5B	Yes	
Long-billed Curlew	12	S2B	Yes	SOC
Marbled Godwit	12	S4B	Yes	
Northern Harrier	11	S4B		
Blue-winged Teal	8	S5B		
Wilson's Snipe	8	S5		
Red-winged Blackbird	8	S5B	Yes	
Sharp-tailed Grouse	7	S4	Yes	
Brewer's Blackbird	7	S5B	Yes	
American Wigeon	6	S5B		
Wilson's Phalarope	6	S4B	Yes	
Killdeer	5	S5B	Yes	
Brown-headed Cowbird	5	S5B		
Mallard	4	S5		
Northern Shoveler	4	S5B		
Ferruginous Hawk	4	S3B	Yes	SOC
Golden Eagle	4	S4		PSOC
Common Nighthawk	4	S5B		
Canada Goose	3	S5B		
Swainson's Hawk	2	S3B		SOC
Brewer's Sparrow	2	S2B	Yes	SOC
Grasshopper Sparrow	2	S3B	Yes	SOC
American Goldfinch	2	S5B		
American White Pelican	1	S3B		SOC
Double-crested Cormorant	1	S5B		
Northern Pintail	1	S5B		
Greater Sage-Grouse	1	S2		SOC
Mourning Dove	1	S5B		
Burrowing Owl	1	S2B	Yes	SOC
Barn Swallow	1	S5B		
Clay-colored Sparrow	1	S4B	Yes	
Lark Bunting	1	S3B		SOC
Yellow-headed Blackbird	1	S5B	Yes	

[The column labeled Breeding Evidence consists of records for which there was direct or indirect evidence of breeding. The Species of Concern list includes Species of Concern as well as Potential Species of Concern as indicated by PSOC].

Presence of Endemic Prairie Bird Species

Five of the ten most abundant species recorded during 2008 are state Species of Concern, all are endemic Great Plains prairie birds (Table 3).

Woody Island Coulee provides important habitat for prairie endemic species of a different composition than those found in Valley County, an area in which the Heritage Program has been conducting annual point counts since 2001. The total percent of points on which Chestnut-collared

Longspurs were detected at Woody Island Coulee was 99% (compared to the average yearly percent of points for years 2001-2006 for this species in Valley County at 81-87%). McCown's Longspur, present in much greater abundance at Woody Island Coulee, was recorded on 69% of the point counts during 2008 (the average Valley County is only between 14% and 31% for years 2001-2006). While the detection rates for Baird's Sparrow and Long-billed Curlew were similar to those in Valley County, Sprague's Pipit is found in greater abundance in north Valley County (Table 4).

Table 3. Top 10 Most-abundant Woody Island Species (2008)

10 Most Abundant Species	Total number of individuals in point count circles	Percentage of point counts in which species was present (n=93)
Chestnut-collared Longspur*	381	98.9%
Western Meadowlark	214	77.4%
Horned Lark	110	95.7%
McCown's Longspur	88	68.8%
Savannah Sparrow	52	49.4%
Vesper Sparrow	38	32.3%
Baird's Sparrow	36	34.4%
Sprague's Pipit	21	22.6%
Long-billed Curlew	11	12.9%
Willet	8	11.8%

* bold denotes Species of Concern

Table 4. Comparison of Detection rates for Species of Concern at Woody Island Coulee with North Valley County, Montana

Species	Percent points detected Woody Island Coulee 2008	Percent points detected North Valley County 2001-2006
Chestnut-collared Longspur	98.9	81.2 - 87.0
McCown's Longspur	68.8	14.0 - 31.4
Baird's Sparrow	34.4	34.2 - 54.0
Sprague's Pipit	22.6	60.9 - 82.1
Long-billed Curlew	12.9	12.6 - 22.2

Documented Species of Concern

Eight Species of Concern were documented during the project work at Woody Island Coulee (see Table 1); five were observed during the formal point count surveys. Listed in decreasing order of abundance they include Chestnut-collared Longspur, McCown's Longspur, Baird's Sparrow, Sprague's Pipit, and Long-billed Curlew. Three Species of Concern, observed during the field surveys, but outside of the 100-meter point count circles, include Lark Bunting, Ferruginous Hawk, and Swainson's Hawk.

The **Chestnut-collared Longspur** (along with the Sprague's Pipit, Baird's Sparrow, Lark Bunting, and McCown's Longspur) is identified as one of the primary (endemic) passerine species of the Great Plains (Samson and Knopf 1996). Historically, the Chestnut-collared Longspur is known to have bred in sites recently grazed by bison (*Bison bison*) or disturbed by fire (Hill and Gould 1997). This species is currently known to occupy habitat exposed to a range of grazing pressure, from none to moderately heavy (Samson and Knopf 1996).

McCown's Longspur generally prefers a heavily grazed landscape for nesting and can be found in areas of moderate to very heavy grazing pressure (With 1994, Samson and Knopf 1996). Distribution of this species is primarily restricted to sparsely vegetated and open, semi-arid shortgrass habitat, or overgrazed pastures generally comprised of shortgrass species mixed with limited cover of mid-grass species, shrubs, and cactus (With 1994). Breeding of the McCown's Longspur may occur in the same general location as that of the Chestnut-collared Longspur, but rarely will they breed in the same pasture unless a mosaic of both short and mid-grasses are present (With 1994).

The **Baird's Sparrow** is an endemic prairie species confined to the northern Great Plains. This migratory songbird prefers mixed-grass and fescue prairie with a scattering of low shrubs and residual vegetation (Green et al. 2002). This species prefers large blocks of lightly grazed to ungrazed midgrass prairie, and is described as "not extremely abundant anywhere in its range" (Johnsgard 2001).

Breeding habitat for **Sprague's Pipit** is restricted to appropriate mixed-grass habitat primarily in three states (Montana, North Dakota, and South Dakota) and three provinces (Alberta, Saskatchewan, and Manitoba) (Samson and Knopf 1996, Johnsgard 2001). This pipit's breeding habitat, like that of the Baird's Sparrow, is one of the most limited for grassland endemics (Johnsgard 2001). Sprague's Pipits are far more abundant in native grasslands than in haylands or croplands, and may be fully absent in pastures dominated by non-native species (Robbins and Dale 1999, Johnsgard 2001). Grasslands of intermediate height and density with moderate litter depths are preferred (Robbins and Dale 1999). The Sprague's Pipit tends to favor grasslands with moderate to no grazing.

The **Long-billed Curlew** prefers moderate to heavily grazed short to mixed grassland (Samson and Knopf 1996, Dugger and Dugger 2002). In general, the Long-billed Curlew will select nesting sites in open, sparsely vegetated prairie, while sites with taller, denser grass are preferred for brood rearing (Dugger and Dugger 2002).

A Great Plains prairie endemic species, the **Lark Bunting** prefers areas of light to moderately heavy grazing (Samson and Knopf 1996). Breeding generally takes place in large, open grasslands of low to moderate height with limited open ground and the presence of some scattered shrubs, such as sagebrush (Johnsgard 2001). Timing of grazing may play a large role in the suitability of breeding sites; heavy summer grazing has been found to be detrimental (Shane 2000). The Lark Bunting was the most abundant Species of Concern recorded during this project.

In eastern Montana, the **Ferruginous Hawk** is a prairie raptor with a diet primarily limited to black-tailed prairie dogs (*Cynomys ludovicianus*) and Richardson's ground squirrels (*Spermophilus richardsonii*) (Bechard and Schmutz 1995, Foresman 2001). Nesting can take place on cliff/rock edges, conifers and, occasionally, man-made structures (Johnsgard 1986).

Generally a species of a grassland or shrubland landscapes, the **Swainson's Hawk** typically nests

in trees scattered within this matrix. If trees are not present, then willow (*Salix* spp.) along riparian areas may also be utilized for nesting sites (England et al. 1997). In addition to foraging in native grasslands, agricultural crops may be used for foraging if prey is present and the crop height does not exceed that of native grasses (England et al. 1997).

Vegetation

The majority (64.5%) of the points fell within areas of greater than 95% grass cover, with the remainder of the sites (35.5%) with at least 55% grass cover. The four other cover type categories represented less than 25% of the cover at any of the surveyed sites (point count circles). See Table 5 below.

Table 5. Vegetation Cover Percentages for Surveyed Point Count Circles

Percent Cover	Number of Point Count Circles with Vegetation Coverage [n = 93]				
	Grass	Shrub	Bare	Wet Meadow	Open Water
0%		1	80	32	92
<1%		31	12	40	
1% - 5%		40	1	20	1
5% - 15%		20		1	
15% - 25%*		1			
55% - 65%*	1				
65% - 75%	4				
75% - 85%	7				
85% - 95%	21				
>95%	60				

* note discontinuity – no percent cover values fell between 25% and 55% for any of the cover types.

CONCLUSION

The present diversity and abundance of prairie-endemic bird species at Woody Island Coulee indicates a variety of habitat elements is available on this unique BLM parcel. The relative abundance of McCown's Longspurs, a species which requires sparse short grass and bare ground (With 1994), compared with other grassland areas in the state, suggests Woody Island Coulee is an area of short-stature grasses. The abundance of Chestnut-collared Longspurs, and to a lesser extent, Sprague's Pipits, both of which show a preference for areas with moderate grass cover and litter, (Hill and Gould 1997, Robbins and Dale 1999) indicate the presence of mid-level grass. Also present, however, were Baird's Sparrows, which require denser grass and litter (Green et al. 2002), suggesting the presence of a taller, more complex structure.

The current management of cattle grazing activities at Woody Island Coulee, offers some semblance to historical grazing by bison, though the effect of domestic cattle grazing on vegetation structure and density can differ markedly from that of bison (Peden et al. 1974, Schwartz and Ellis 1981). Grazing effects of cattle and bison, however,

can be similar at the right scale; this scale is dependent, certainly, upon the species in question and the ability of land managers to address habitat elements specific to each species. Maintaining both grazing and other natural disturbance (e.g. fire) regimes that mimic the frequency and intensity of historic conditions will result in a mosaic of vegetation structures. These conditions are critical to supporting high species diversity; without them many species would likely disappear from this landscape.

Current management activities at Woody Island Coulee allows for a unique composition of Northern Great Plains native grassland bird species. The property contains the highest concentration of McCown's Longspurs for any area surveyed by the Montana Natural Heritage Program, and possibly for any public lands site in Montana. The diversity and abundance of the endemic grassland bird Species of Concern documented at Woody Island Coulee warrants continued and enhanced protection for this unique BLM property. Woody Island Coulee is critical to the conservation of Montana's grassland bird species.

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APPENDIX A. GLOBAL / STATE RANK DEFINITIONS

HERITAGE PROGRAM RANKS

The international network of Natural Heritage Programs employs a standardized ranking system to denote global (range-wide) and state status. Species are assigned numeric ranks ranging from 1 to 5, reflecting the relative degree to which they are “at-risk”. Rank definitions are given below. A number of factors are considered in assigning ranks — the number, size and distribution of known “occurrences” or populations, population trends (if known), habitat sensitivity, and threat. Factors in a species’ life history that make it especially vulnerable are also considered (e.g., dependence on a specific pollinator).

GLOBAL RANK DEFINITIONS (NatureServe 2003)

G1	Critically imperiled because of extreme rarity and/or other factors making it highly vulnerable to extinction
G2	Imperiled because of rarity and/or other factors making it vulnerable to extinction
G3	Vulnerable because of rarity or restricted range and/or other factors, even though it may be abundant at some of its locations
G4	Apparently secure, though it may be quite rare in parts of its range, especially at the periphery
G5	Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery
T1-5	Infraspecific Taxon (trinomial) —The status of infraspecific taxa (subspecies or varieties) are indicated by a “T-rank” following the species’ global rank

STATE RANK DEFINITIONS

S1	At high risk because of extremely limited and potentially declining numbers, extent and/or habitat, making it highly vulnerable to extirpation in the state
S2	At risk because of very limited and potentially declining numbers, extent and/or habitat, making it vulnerable to extirpation in the state
S3	Potentially at risk because of limited and potentially declining numbers, extent and/or habitat, even though it may be abundant in some areas
S4	Uncommon but not rare (although it may be rare in parts of its range), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern
S5	Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range

COMBINATION RANKS

G#G# or S#S# **Range Rank**—A numeric range rank (e.g., G2G3) used to indicate uncertainty about the exact status of a taxon

QUALIFIERS

NR	Not ranked
Q	Questionable taxonomy that may reduce conservation priority —Distinctiveness of this entity as a taxon at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority (numerically higher) conservation status rank

X	Presumed Extinct —Species believed to be extinct throughout its range. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered
H	Possibly Extinct —Species known from only historical occurrences, but may never-the-less still be extant; further searching needed
U	Unrankable —Species currently unrankable due to lack of information or due to substantially conflicting information about status or trends
HYB	Hybrid —Entity not ranked because it represents an interspecific hybrid and not a species
?	Inexact Numeric Rank —Denotes inexact numeric rank
C	Captive or Cultivated Only —Species at present is extant only in captivity or cultivation, or as a reintroduced population not yet established
A	Accidental —Species is accidental or casual in Montana, in other words, infrequent and outside usual range. Includes species (usually birds or butterflies) recorded once or only a few times at a location. A few of these species may have bred on the one or two occasions they were recorded
Z	Zero Occurrences —Species is present but lacking practical conservation concern in Montana because there are no definable occurrences, although the taxon is native and appears regularly in Montana
P	Potential —Potential that species occurs in Montana but no extant or historic occurrences are accepted
R	Reported —Species reported in Montana but without a basis for either accepting or rejecting the report, or the report not yet reviewed locally. Some of these are very recent discoveries for which the program has not yet received first-hand information; others are old, obscure reports
SYN	Synonym —Species reported as occurring in Montana, but the Montana Natural Heritage Program does not recognize the taxon; therefore the species is not assigned a rank
*	A rank has been assigned and is under review. Contact the Montana Natural Heritage Program for assigned rank
B	Breeding —Rank refers to the breeding population of the species in Montana
N	Nonbreeding —Rank refers to the non-breeding population of the species in Montana

**APPENDIX B. SAMPLE PHOTOGRAPHS OF CHARACTERISTIC SITE
VEGETATION**

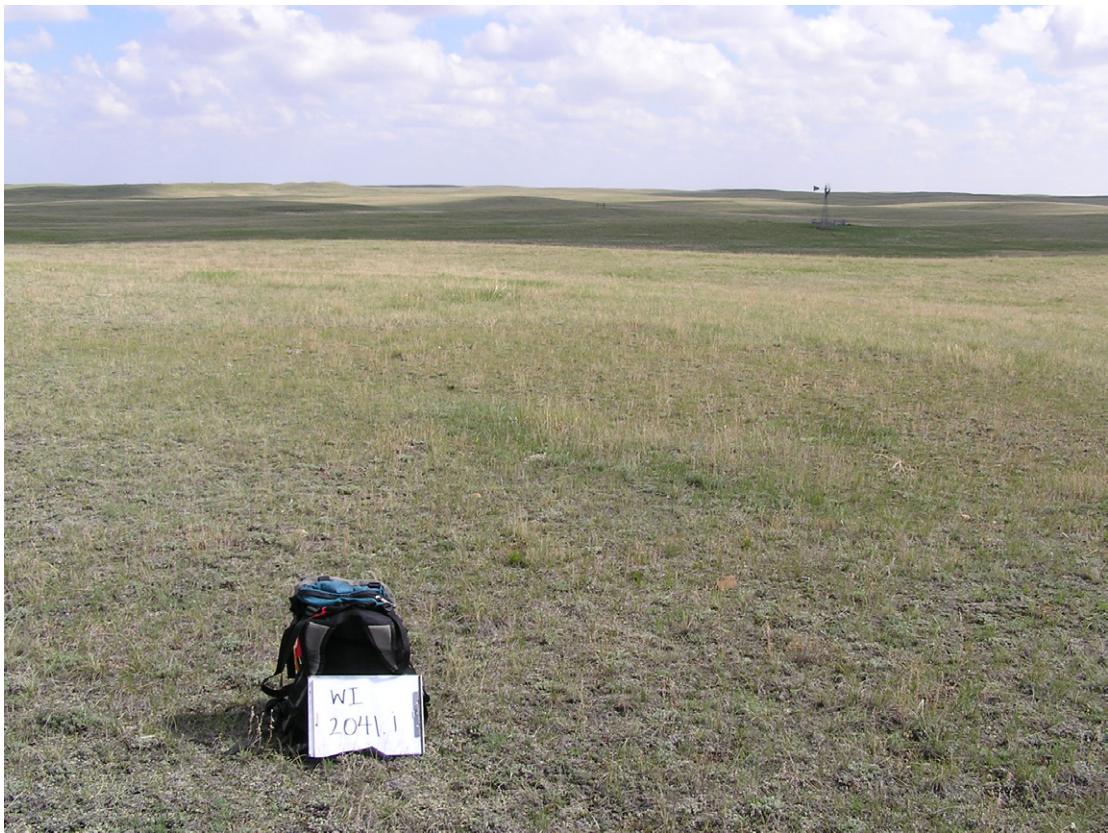


Photo 1: Example of point count location in short-stature grass – Woody Island Coulee



Photo 2. Example of point count location in taller, more complex grass structure – Woody Island Coulee

APPENDIX C. POINT LOCATIONS - WOODY ISLAND COULEE 2008

Point	Latitude	Longitude
1.1	48.98861667	-108.6412333
1.2	48.98576667	-108.6412833
1.3	48.99128333	-108.64125
2.1	48.9838	-108.4532667
2.2	48.98106667	-108.4533333
2.3	48.9784	-108.4533167
3.1	48.96489	-108.518434
3.2	48.96486667	-108.5225167
3.3	48.96508333	-108.5265833
4.1	48.97911667	-108.5107667
4.2	48.97641667	-108.51075
4.3	48.97375	-108.5107167
5.1	48.97916667	-108.6412833
5.2	48.98183333	-108.6413
5.3	48.97648333	-108.6413333
6.1	48.96638333	-108.4661333
6.2	48.9637	-108.46615
6.3	48.96103333	-108.4662667
7.1	48.96028333	-108.4944167
7.2	48.96315	-108.4944333
7.3	48.96596667	-108.4944
8.1	48.96955	-108.53015
8.2	48.96688333	-108.531
8.3	48.96428333	-108.5319333
9.1	48.96381667	-108.6138667
9.2	48.96653333	-108.61385
9.3	48.96923333	-108.6139
10.1	48.99391667	-108.4719833
10.2	48.99393333	-108.4678333
10.3	48.9939	-108.4636833
11.1	48.9891	-108.5044333
11.2	48.99178333	-108.5044
11.3	48.99445	-108.5043667
12.1	48.98881667	-108.5292167
12.2	48.98883333	-108.5333
12.3	48.98881667	-108.5374333
13.1	48.99238333	-108.5487
13.2	48.9897	-108.5486833
13.3	48.98703333	-108.5487
14.1	48.969233	-108.414833
14.2	48.969067	-108.41885
14.3	48.968933	-108.423
15.1	48.972983	-108.42675
15.2	48.973633	-108.4228
15.3	48.974267	-108.41885
16.1	48.972692	-108.411897

Point	Latitude	Longitude
16.2	48.972683	-108.4077
16.3	48.972683	-108.403583
17.1	48.966267	-108.40335
17.2	48.963717	-108.401917
17.3	48.96115	-108.400567
18.1	48.977583	-108.6289
18.2	48.98025	-108.628867
18.3	48.982933	-108.628867
19.1	48.9986	-108.48735
19.2	48.995883	-108.487333
19.3	48.993133	-108.487283
20.1	48.9933	-108.624933
20.2	48.99065	-108.6254
20.3	48.987917	-108.625917
21.1	48.973267	-108.597717
21.2	48.9733	-108.601783
21.3	48.9733	-108.606083
22.1	48.965067	-108.603533
22.2	48.967733	-108.603517
22.3	48.970433	-108.603517
23.1	48.9784	-108.546
23.2	48.978417	-108.550233
23.3	48.97845	-108.554367
24.1	48.979333	-108.524483
24.2	48.979317	-108.528783
24.3	48.979317	-108.532867
25.1	48.95465	-108.46525
25.2	48.9544	-108.461133
25.3	48.9549	-108.469333
26.1	48.956917	-108.525533
26.2	48.95425	-108.525567
26.3	48.950633	-108.525517
27.1	48.95475	-108.511833
27.2	48.9565	-108.515033
27.3	48.9582	-108.518167
28.1	48.9556	-108.492467
28.2	48.955717	-108.487733
28.3	48.955833	-108.4836
29.1	48.977567	-108.494183
29.2	48.97495	-108.494867
29.3	48.97225	-108.4956
30.1	48.98885	-108.445833
30.2	48.989067	-108.449867
30.3	48.9893	-108.454183
31.1	48.9797	-108.472833
31.2	48.980167	-108.468717
31.3	48.980533	-108.464567